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DON'T FORGET RUST PREVENTATIVES

IN establishing production specifications involving any phase of the finishing of steel parts it is necessary to give due thought in advance to the prevention of rust. Wherever a freshly prepared surface is left in contact with the atmosphere or is handled by certain operators possessing an "acid touch," as after machining or degreasing operations, that surface is particularly prone to oxidation and rust formation.

Even when minimum requirements have been set up to prevent rust, it frequently occurs that a series of hot, damp days is seen to wreak havoc with the rust prevention program. In such cases it is necessary to raise the minimum requirements.

There are many proprietary rust preventatives on the market, many of which are exceedingly effective. Most of them are not used in concentrated form, but are diluted with from one to three parts of oleum spirits or other inexpensive solvent. Such preparations will exert their maximum effect when sufficient time is allowed to elapse for the volatile solvent to evaporate prior to handling, as a more adherent, impermeable coating results. In this connection it should be stated that the oleum spirits referred to is the organic solvent, and not fuming sulfuric acid, which is also called oleum.

Although the validity of salt spray tests designed to measure the effectiveness of rust preventatives is debatable at best, these tests still possess the advantage that nothing better has so far won universal recognition. While it is difficult to duplicate individual salt spray tests, it is still possible to compare several preventatives by testing them all at the same time and under the same conditions. Or, their relative effectiveness can be measured by actual performance in service.

In making tests, some operators prefer to measure the time required for the first spot of rust to appear. Ohers estimate the total areas of rust produced in a given time. Another method is to weigh small polished steel specimens to the fourth decimal place in grams, both before and after rusting. In this case the increase in weight divided by the original weight and multiplied by 100 gives the percentage of rust formed, and has the advantage of minimizing the personal equation.

Rust, a form of oxidation, is a source of immeasurable waste. With rust it is only too true that "an ounce of prevention is worth a pound of cure." Of no more avail than the famous locking of the barn door after the theft of the renowned equine is stroking one's beard in deep thought while gazing at an assembly line of rusted parts.

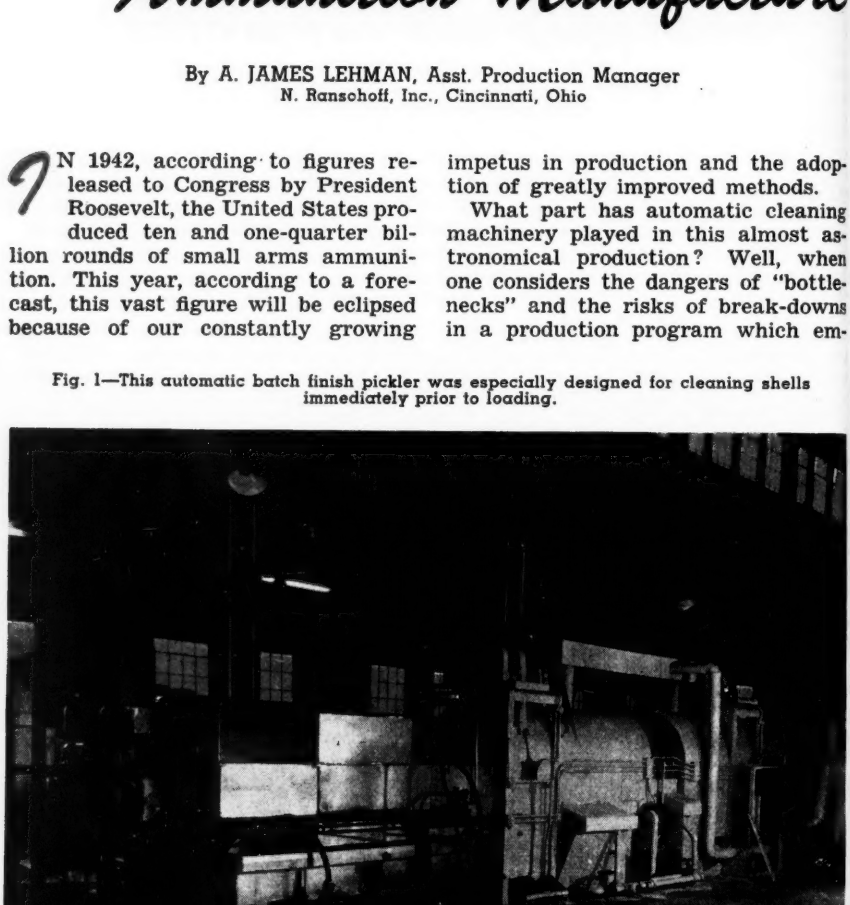
Automatic Cleaning Machinery Accelerates Ammunition Manufacture

By A. JAMES LEHMAN, Asst. Production Manager
N. Ransohoff, Inc., Cincinnati, Ohio

IN 1942, according to figures released to Congress by President Roosevelt, the United States produced ten and one-quarter billion rounds of small arms ammunition. This year, according to a forecast, this vast figure will be eclipsed because of our constantly growing impetus in production and the adoption of greatly improved methods.

What part has automatic cleaning machinery played in this almost astronomical production? Well, when one considers the dangers of "bottlenecks" and the risks of break-downs in a production program which em-

Fig. 1—This automatic batch finish pickler was especially designed for cleaning shells immediately prior to loading.



bodies such staggering amounts of vital ammunition, it becomes a matter of tremendous importance. Time is of the essence and the tiniest fractions may be sufficient to throw the entire war effort out of gear.

Fortunately, manufacturers of automatic cleaning machinery had learned a great many lessons before the war. This experience was sufficient to eliminate many of the "bugs" which had to be overcome by hard work and patient experimentation in laboratories, shops and field. But new problems arose and continue to arise. American ingenuity has solved most of them.

This situation has been particularly true in the metal cleaning field. And, when you remember that there are from 25 to 30 distinct cleaning and pickling operations involved in the manufacture of a .30 or .50 calibre cartridge, the proportions of the problems grow into a gigantic task. Cleaning, especially, is one of the most vital of the operations. Without proper cleaning, subsequent operations cannot proceed with any degree of satisfaction. Precision calibrations depend on the accuracy of the material to be handled and faulty cleaning is sure to make final processing impossible. On the other hand, thorough, scientific, dependable cleaning helps insure perfect work which is so essential to such a sensitive instrument as a shell or cartridge. Shell cases must be right or our soldiers may just as well be firing blanks. And with this in mind, cleaning equipment manufacturers have done remarkably well.

One of the greatest savings in time and manpower has been made in the finishing of the cases. This final series of operations is the last cleaning and finishing process before the case is actually loaded. It consists of an acid roll in a weak sulphuric acid solution, followed by a water rinse, a soap roll, another rinse, and dry.

Formerly these operations were begun in a tilting tumbling barrel, open at one end. The cases and pickling solution were loaded into the barrel and the cases were tumbled in the solution. Then the solution had to be drained from the barrel and the work rinsed. After rinsing, the barrel had to be drained again before the work could be tumbled in a soap solution. Again the barrel was drained and the work rinsed. Then the cases were removed from the barrel and placed in a drier. The various draining and loading operations involved in the process obviously consumed a great deal of time and labor.

Early in the defense effort, an automatic batch finish pickler was designed which performed this entire series of operations in one continuous process. The unit, shown in Fig. 1, consists of three rolling drums, each emptying through a cylindrical perforated screen. Each drum is equipped with a discharge head which holds the work in the drum as long as the drum is rotating in a tumbling direction. When the direction of rotation is reversed, the drum is emptied automatically.

The work is fed into the first drum and rolled in the pickling solution for approximately five minutes. The direction of the drum's rotation is then automatically reversed, and the work passes out of the drum into a cylindrical perforated screen in which it is rinsed. The work is carried through the screen by spirals and passes into the second drum, where it is rolled in a soap solution. After soap rolling, the second drum is reversed and the work automatically carried out of the drum and rinsed in a screen as before. The cases are then drained by rolling in the third drum, which also discharges when the direction of rotation is reversed. The cases are then discharged into a cylindrical screen where they are dried by recirculation of hot air.

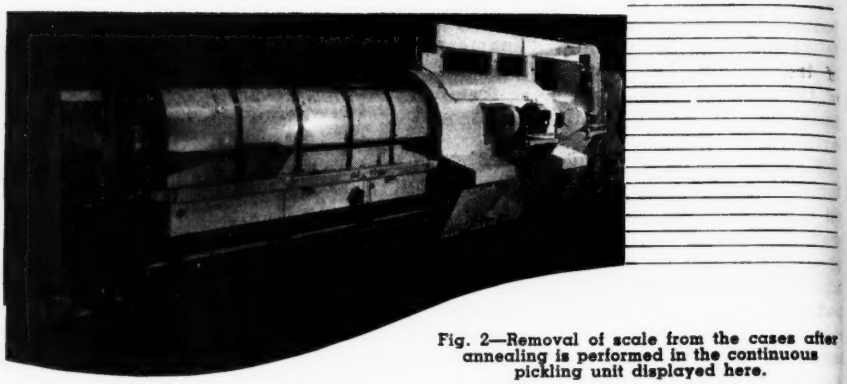


Fig. 2—Removal of scale from the cases after annealing is performed in the continuous pickling unit displayed here.

All three drums are synchronized and are controlled by one master timing device. Thus, the second drum begins to rotate in a tumbling direction as soon as the first drum has completed its cycle of reverse rotation. Likewise, the third drum begins to tumble as soon as the second drum has finished reversing. In this way the work is automatically carried from one drum to the next and the entire operation made one continuous process.

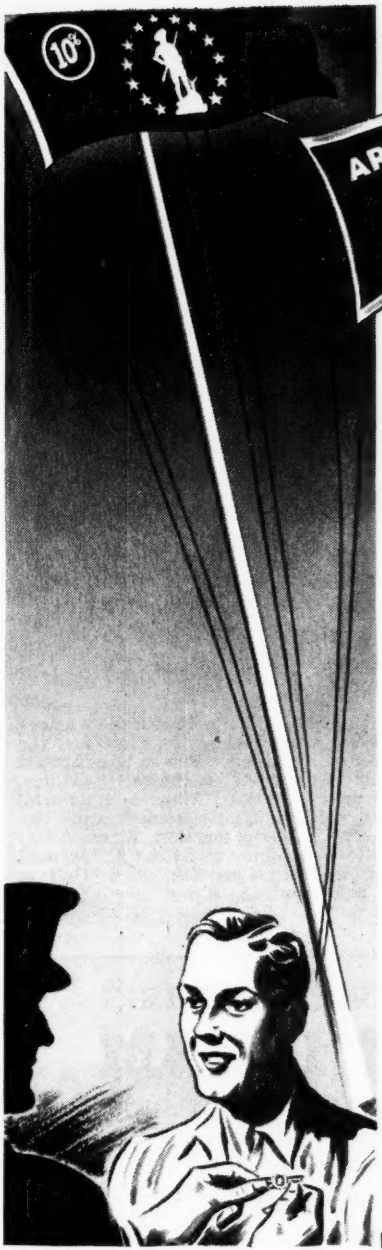
What this single unit has meant to production is illustrated by the experience of one large company. After its first installation of three of these cleaning units, this company found that it required only one man to operate all three units, instead of the 18 men needed to turn out an equal quantity of work by the old method. Thus, operating three shifts a day, this company saved 51 man-days every day—a total of 2,856 man-hours per week.

Another important operation in the manufacture of small arms ammunition is the removal of scale from the cases after annealing. This operation involves pickling the cases in a sulphuric acid solution, followed by a rinse, immersion in a neutralizing solution, another rinse, and dry. Here, too, a machine was designed and built to reduce the operation to one continuous process. As shown in Fig. 2, this continuous pickling unit consists of a cylindrical drum through which the work is carried by spirals welded in place.

The drum is made solid with perforated draining sections. The liquid is brought into the drum by dip buckets. The buckets are attached to the outside of the drum and dip up the solution from tanks below. Once inside, the liquid is kept at a constant height by discharge heads which maintain a constant level of solution, but permit continuous circulation.

Another essential requirement in ammunition production is that cases must be thoroughly cleaned before annealing, trimming, machining, and various draws. Figure 3 presents the cylindrical drum-type unit with welded spirals to feed the work through the drum which was designed to handle this job.

Since it is essential in these various operations that the cases be absolutely clean, the unit is equipped with a soak section which loosens the dirt on the cases. A level of solution is maintained by the same discharge head previously described. After the cases receive the soak wash, they pass through a spray wash and a rinse, and are dried by a recirculation of



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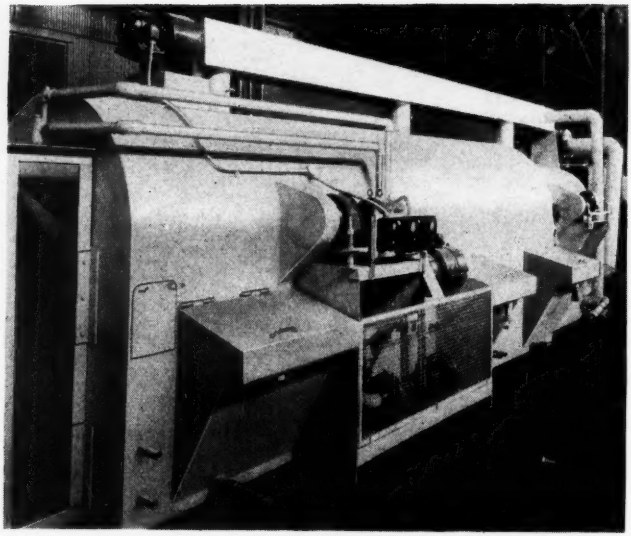

Fig. 3—This cylindrical drum-type unit is used to clean the cases thoroughly before annealing, trimming, machining and various draws.

hot air. In order to insure a thorough washing and rinsing, these solutions are pumped through a pipe inside the drum and the work subjected to a strong spray which washes off the dirt loosened by the soak.

By use of continuous machines such as the ones described in this article, it has been possible for modern plants to use conveyor systems for transporting the cases from one operation to another. The result is a substantial saving in time and manpower.

Measuring and Control Instruments. Wheelco Instruments Co., Harrison and Peoria Sts., Chicago, Ill., has prepared for distribution Bulletin Z6200, covering the features of Wheelco measuring and control instruments. Copy free upon request.

Corrosion. Protective Coatings, Incorporated, P. O. Box 56 PF, Strathmoor Station, Detroit, Mich., has issued a booklet giving details about the various products which they market for the control of corrosion. Products described include Synthetex technical coatings, Silco metal coating, Alkacite industrial coatings, Black Magic process, tank linings, "30" paper protection, Vincul metal conditioner, Vinculux No. 2, Aquanil water and rust-proofer, and Helfyre high heat coating. Copy free upon request.

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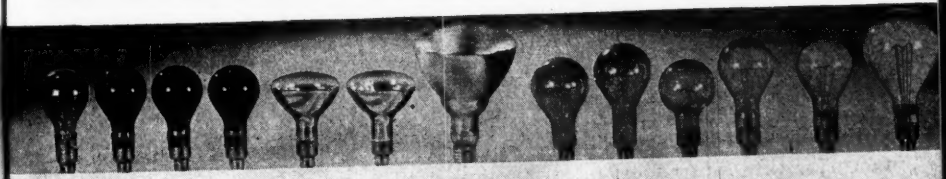

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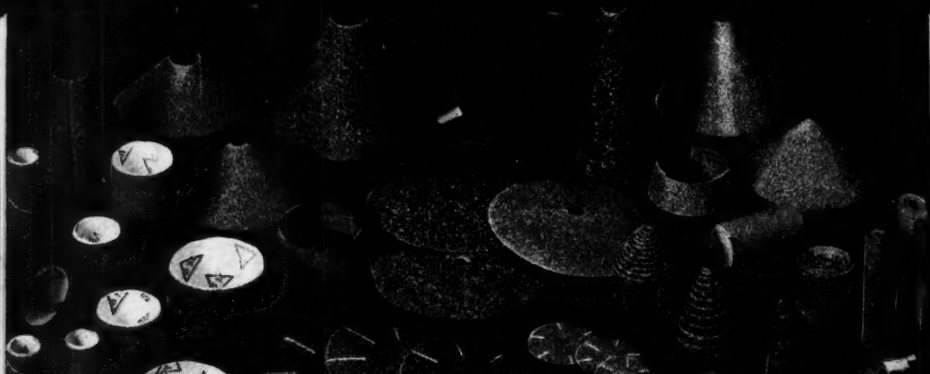

Abrasive Cloth Gadgets Speed War Work

By A. J. SIDFORD, Vice President
Behr-Manning Corporation, Troy, New York

TO one who is old in the "sandpaper" business, even more so than to those who have only recently been interested—whether from the producing or the using end—many of today's ready-to-use forms are almost unbelievably ingenious and time-saving.

Reams of sheet products, various widths of rolls from 1 to 48 inches wide, discs from 18 to 30 inches in diameter cut from standard materials—all of these have been known for years. Then came the making of joined belts by the abrasive manufacturers, the introduction of fibre combination discs, cones for automotive work, waterproof papers for the wet rubbing of finish coats. However, all of these seemed still in the line of regular products.

Today, under the extreme pressure for speed in sanding and finishing metal parts, have been added many small "gadgets" of abrasive cloth—little devices for use on portable and flexible shaft machines. In many cases they do in seconds what used to require minutes by hand methods, and do it far more effectively and leave a better surface.

Apertures and recessed areas that

require a high finish, which are inaccessible for hand sanding, are reached by little abrasive cloth tools used on the end of a mandrel or draped around the mandrel shaft.

In theory, some of the shapes are old; in practice, they are brand new. Spirabands are successors to small joined belts or tubes, which have been in more or less common use for years. But by the spiral method—Metalite cloth wound over an extra cloth liner for strength — tiny devices starting with ¼ inch in diameter and in length are available. While such sizes as 1 x 1½ inches or 1½ x 2 inches are more usual, and diameters up to 6 inches and widths to 2 inches are called for, Spirabands made in all these sizes and in all standard grit numbers have been a tremendous boon to the plant faced with smoothing raw edges on drawn, stamped or sheared metal parts; the removal of tool marks or burrs along edges or from flat or concave areas. Figure 1 is an illustration of a 2 x 2-inch Spiraband in use for sanding one of the latter class.

Discs, as previously mentioned, have been known for years, but with the exception of those used by the dentist, the potential uses of them were not realized. The small discs of Metalite cloth, starting at ½-inch diameter, are slotted so as to fold up like an umbrella when forced into a hole that has to be cleaned, burred and given a radius on the edge or edges.

The illustration Fig. 2 shows how two of these slotted discs (back to back) in one pass put on the radius, clean the hole, and reverse the operations on the return stroke. While the illustration shows a 2-inch hole and 2¼-inch slotted discs, holes as small as ⅜-inch diameter can be treated in the same manner. Discs of this type are fitted to a small screw-type mandrel, ⅛ or ¼-inch shank, to fit standard high speed tools.

Spirapoints are the newest members of the Metalite gadget family. These tapering shapes — some with varying heights of sidewall—will fit into low areas, particularly those with varying radii.

On the connecting rod job presented in Fig. 3, the flutes are of different width, depth and radius, but the Spirapoint, which is held in a portable tool chucked in a vise, reaches and finishes all the depressed parts. The nose, scarcely over ⅛ inch, cleans up any of the smallest areas. For those next wider and deeper portions, the part is merely held more nearly horizontal.

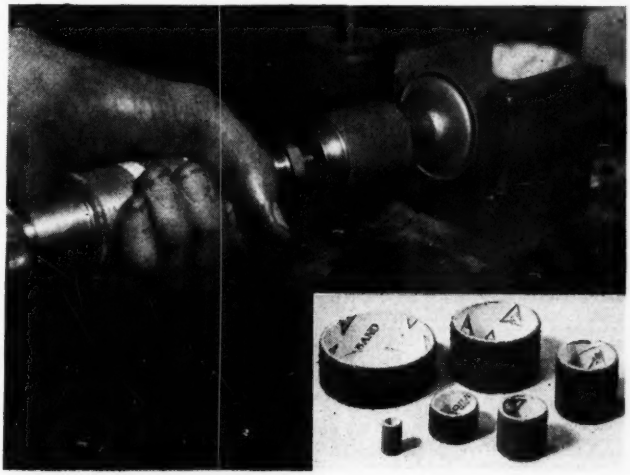

Figure 1
Spirabands

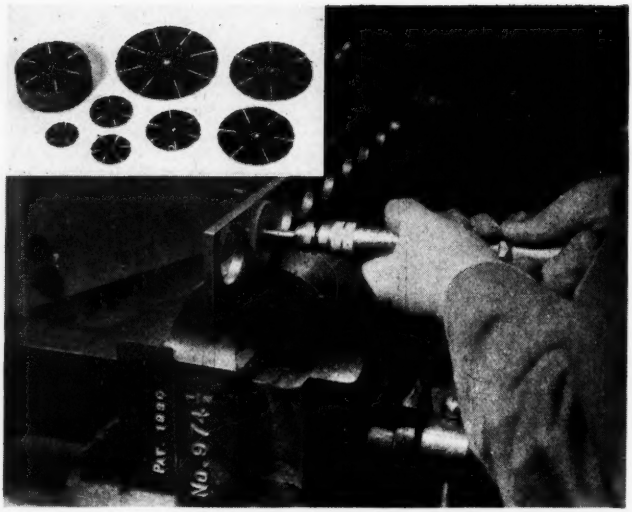

Figure 2
Metalite Cloth Discs

diameters and in three general classes: full-glued, half-glued and taper. Figure 4, in which the operation of sanding a fillet is shown, gives an example of one kind of job for which Pencils are intended; other jobs are polishing channels and corners. The uniformity of cutting action, the speed and steadiness of this mechanical operation—instead of haphazard hand work — are special features of this method. Some plants wind their own Pencils and fasten them with a bit of adhesive tape. For such operations a split mandrel is

In cases where the part is stationary and the tool is free in the hands of the operator, he reaches the narrower parts to be sanded by making contact at about 45 degrees; then the angle is decreased until, for the broader sections of any such job, the tool is held almost horizontal and the entire abrading area contacts the work.

For the application of Spirapoints—and for the "Pencils" described here—a threaded mandrel with pilot is used. Pencils, which are really small rolls of abrasive cloth, are furnished in various lengths and

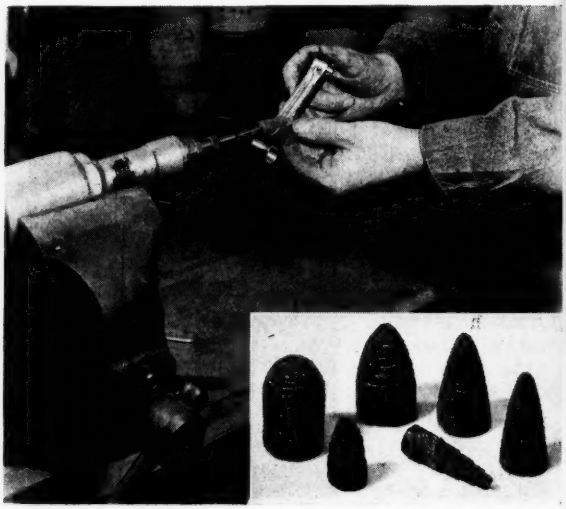

Figure 3
Spirapoints

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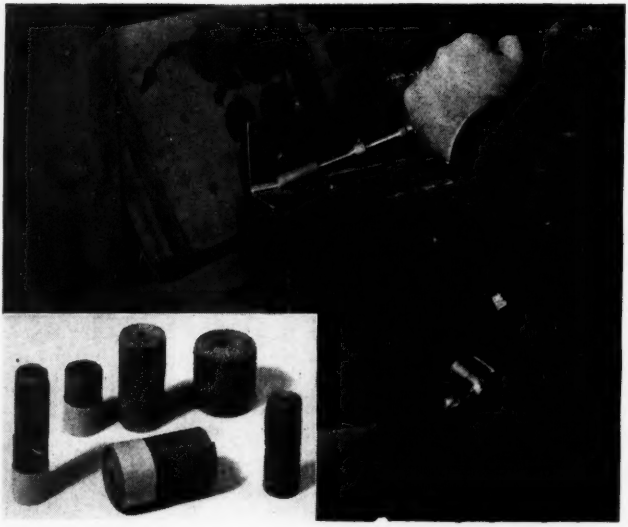


Figure 4
Pencils

employed.

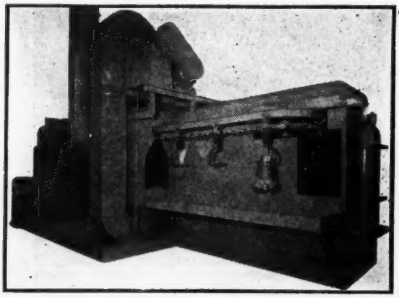
Here's a product that bears no resemblance to any of the foregoing: "Spiracords," narrow strips spirally wound to exact inside diameters of ⅛, ¼, ⅜, ½ and ¾ inch—all 8 inches long.

While originally made for hand use, Spiracords are also used on a mandrel chucked in a drill press or in a portable tool for polishing the walls of small, deep holes impossible to sand in any other way, as shown in Fig. 5.

Another example of the varied types of abrasive products is the "Mushroom" pad and the pre-moulded Metalite cloth discs to fit it (see Fig. 6). The pad is of medium soft rubber moulded over a fixture with a ¼-inch shank. The projecting nib centers exactly the 3 x ¼-inch Mushroom disc, which is applied by means of pressure-sensitive cement.

The old adage, "Necessity is the mother of invention," fits all these gadgets, for it was the impelling force of speed and more speed on war jobs that brought these ingenious new products into existence. This statement is especially applicable to the Mushroom pad.

Airplane manufacturers, faced with many problems of shaping, grinding and polishing drawing dies for various sheet metal parts of wings, fuselage, tail assemblies and other parts, sought a finishing tool that would handle a coated abrasive product for these (up to then) slow jobs. Ths Mushroom



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EQUIPMENT

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It will pay you to look into this . . .
we'll be glad to give you full details.

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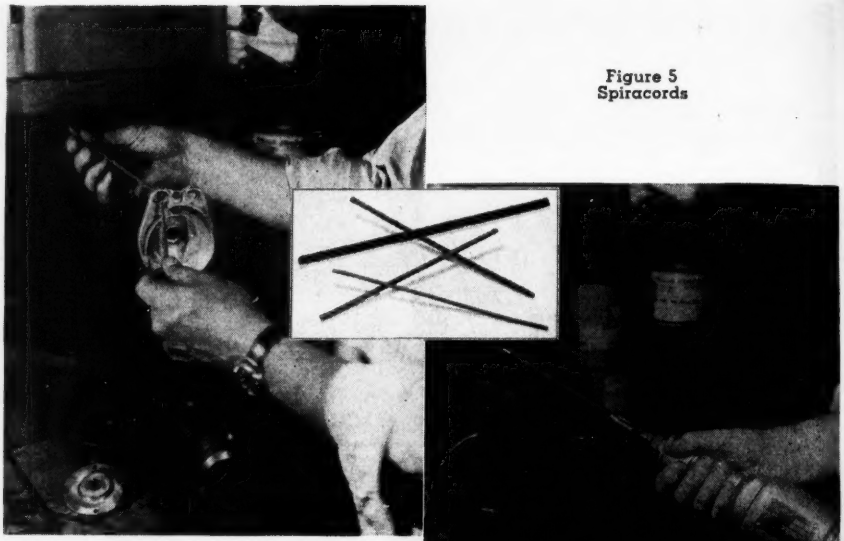

Figure 5
Spiracords

pad was the direct result of the search. It weighs only three ounces, is adapted for use on many jobs other than those mentioned, and stands speeds up to 5,500 r.p.m. The discs for use with the pad are made in all standard grits.

Despite all the publicity in trade papers and bulletins and the efforts of coated abrasives engineers in putting across the gospel of "abrasive

Figure 6
Mushroom Pads

cloth gadgets for speeding up the war effort," hundreds, yes, thousands of jobs are still being done by older, slower methods—often by hand. Progressive metal finishers who are faced with problems similar to those discussed in this article will do well to investigate the possibilities of "abrasive cloth gadgets."

Protective Coating for Extremely Corrosive Conditions. A 12-page data bulletin which summarizes the unusual properties of Ucilon, a surface coating material that is said to stand up under many of industry's most corrosive service conditions, has been prepared by United Chromium, Inc., 51 E. 42nd St., New York, N. Y. Because Ucilon is formulated with new and improved synthetic resins, it produces tough, flexible coatings that are resistant to organic and inorganic acids, alkalies, salts, alcohol, gasoline, oils, greases and moisture; it also has excellent dielectric strength and can be readily applied to wood, metal, concrete, and other surfaces by brushing, spraying or dipping. Ucilon F is a special formulation for use in contact with food products.

Although the special war applications of Ucilon cannot be revealed, this booklet illustrates many essential uses and will suggest countless more. Copies available upon request.

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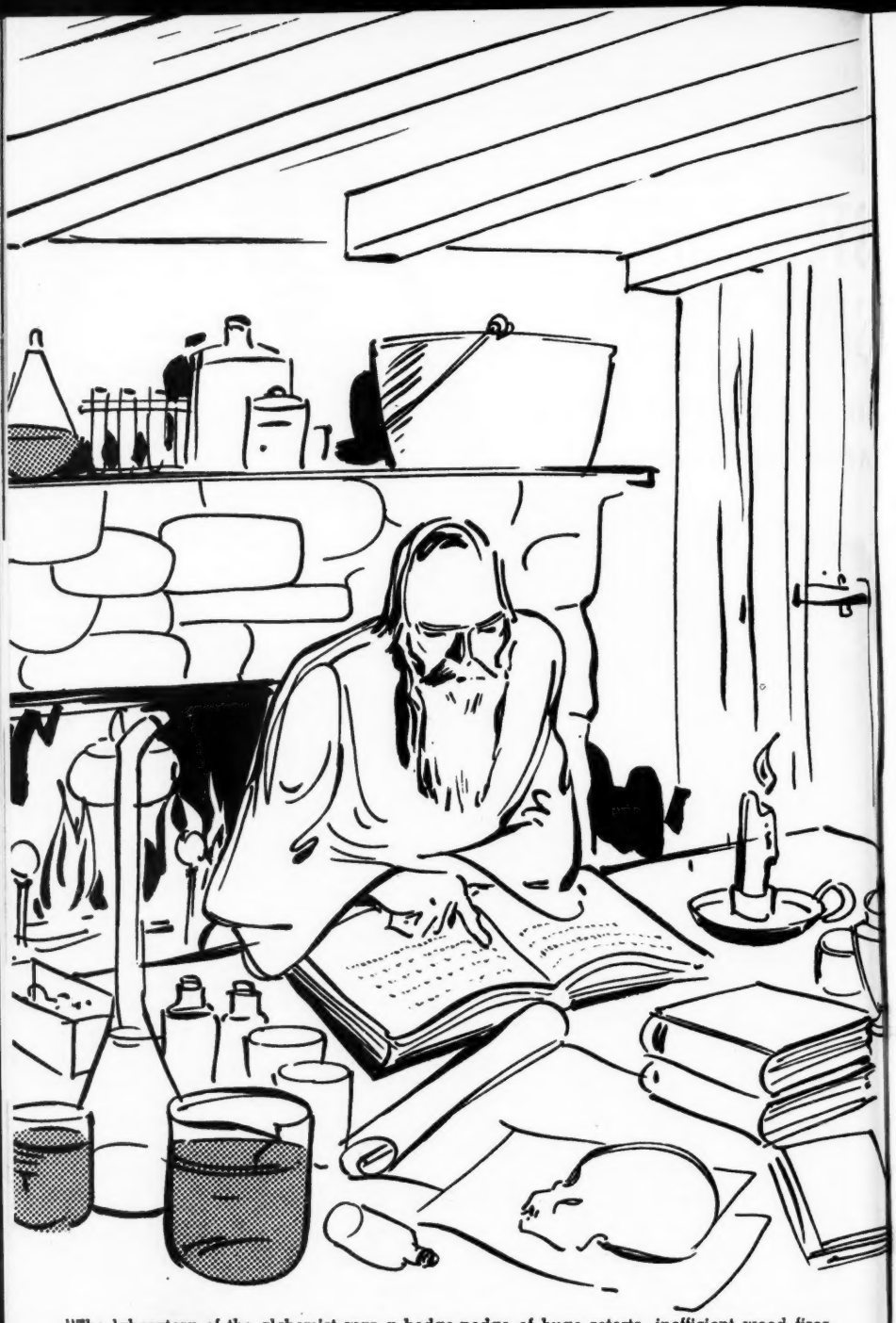


"The laboratory of the alchemist was a hodge-podge of huge retorts, inefficient wood fires, pottery receptacles, dusty manuscripts and iron kettles . . ."

The History of Electroplating

Part 4—Chemical Discoveries Leading to Plating

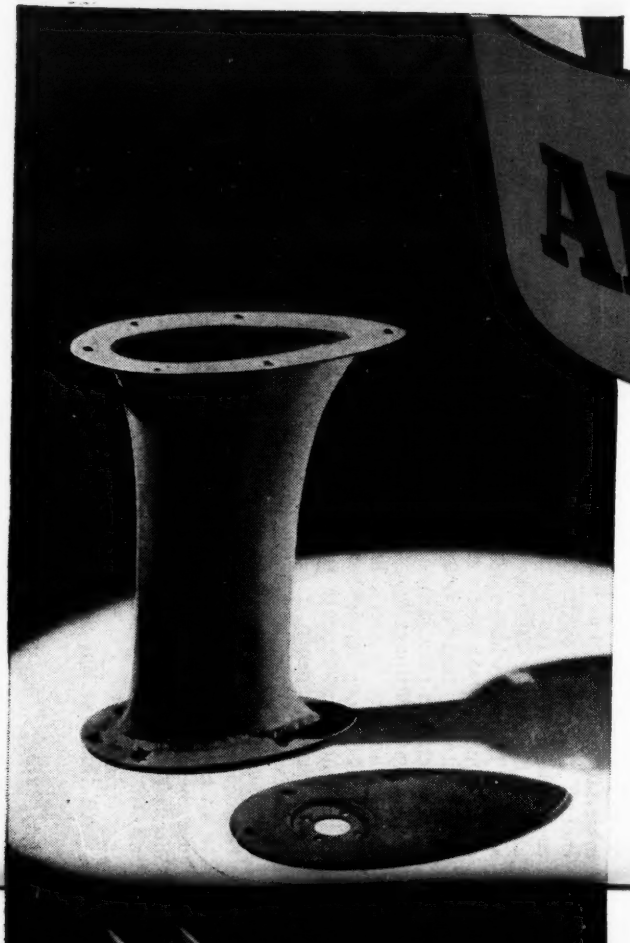
By BRYANT W. POCOCK

THE intervening years between the time of the Troglodytes and the period, let us say, of 300 A.D., were fraught with lessening physical hardship and growing philosophic speculation on the significance of man's surroundings. Certain materials, for example, came to be regarded as more valuable than other materials, and the question naturally arose of making the first from the second. Gold had been a valuable material for a long time. It was hard enough for many purposes, it possessed a pleasing color, and it was always the same. It was, however, scarce. That is what made it valuable. Why not take some more common material that nobody wanted very much and turn it into gold?

This was a brilliant idea, and a lot of people went to work on it. The fact that nobody succeeded was one of the most unfortunate things that could have happened, for it delayed the advent of true chemistry nearly 1500 years. What might, given a little encouragement, have developed into an immediate chemical profession, became nothing but a mumble-jumble hocus-pocus of magical formulas, mystic incantations and superstitious rigmarole.

All this was not without its good side, microscopic though that may have been. A lot was learned about what it is impossible to do, and considerable thousands of methods were devised how one can go about not doing it; but more important, elaborate records were kept of ingenious pieces of apparatus and of the actual properties of some substances. The pity of it was that gold in the form of great wealth to himself and all mankind was ever under the philosopher's nose, had he but recognized it. A little more interest shown in the value of some of the things he did accomplish and less emphasis upon the quest for ever-elusive yellow metal would have given him riches beyond his wildest dreams.

The laboratory of the alchemist was a hodge-podge of huge retorts, inefficient wood fires, pottery receptacles, dusty manuscripts and iron kettles; his reagents ranged from human blood and human bones to extracts of putrefied horses' tails. The scene of his operations was usually the best room in his house, to the distraction of the rest of his family, for he frequently entertained distinguished visitors there in the hope that a bit of substantial subsidy might be forthcoming. There was no order whatever in his equipment and very



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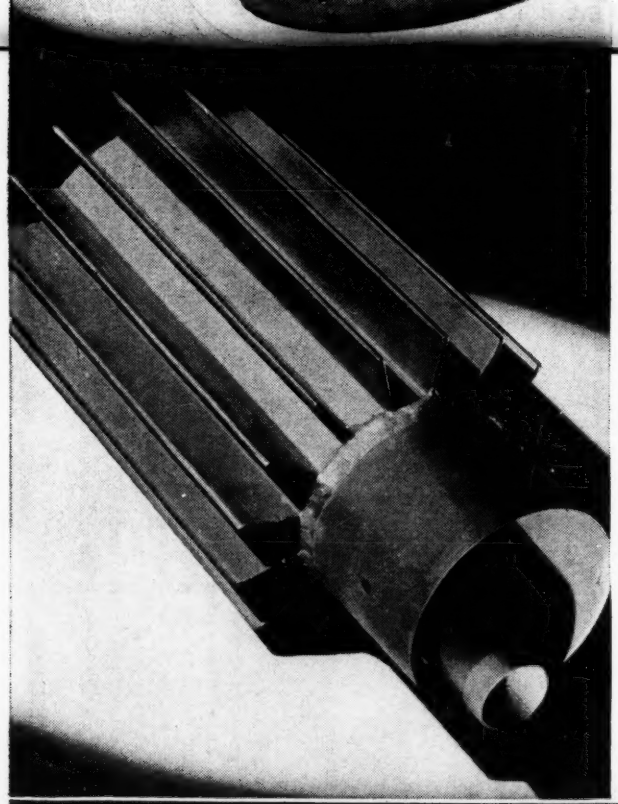

serving on planes used by our armed forces.

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little in anything that he did. He pattered into his den in the morning, pottered there all day, and pattered out again at night. Occasionally he slept there. He was a visionary and dawdler par excellence. One can only be thankful that he took copious notes and invented s o m e rather clever gadgets.

The origin of chemistry as a profession is intimately concerned with the long-delayed realization that the doddering alchemist really had something and didn't know it. In the musty records of his sinister machinations were found, centuries later, scraps of information suggestive of natural law. Those interested in the pursuit and classification of natural phenomena verified these gleanings of a pseudo-science and performed suggested additional experiments. As rapidly as worth-while information came to light, it was applied and refined.

A systematic program of this nature required the facilities of an orderly workshop. The living room would no longer do—any more than it would do for smoking hams or shoeing horses. Accordingly, a special room was set aside and equipped with a semblance of organized apparatus. Illuminating gas became available, and Robert Bunsen invented his famous burner. The glass makers' guild developed their artisanship to a point where they could manufacture specialized laboratory appliances to order. Such things as test tubes, beakers, flasks, condensers, and a host of more complicated implements came into being. The tools of the chemist were at hand.

How he applied those tools and arranged his equipment for the furtherance of human knowledge constitutes one of the most fascinating stories in the annals of science. The history of chemistry is resplendent with records of brilliant discoveries, shrewd observations and ingenious conclusions and hypotheses. The isolation, one by one, of 92 chemical elements, comprising the building blocks of the known universe, and the synthesis and classification of thousands upon thousands of organic and inorganic compounds, are monuments indeed to the achievements of a persistent mankind.

Compare these elements with those contained in the philosophy of Aristotle (384-322 B.C.). Aristotle recognized four primary elements: air, earth, fire and water. Everything known to man was supposed to be made of these four substances arranged in varying proportion. Plato dutifully explained the corrosion of copper and iron by the loss of some earth by these metals.

The name chemistry has a variety of roots. The Arabic word chema means "to hide." The Coptic chems signifies "obscure." According to Plutarch, Egypt was originally called Chemia, because of its black soil.

Venable[7] relates that chemistry originated as a black art. It seems that Count Zosimus records that huge giants were born of unions of angels with the daughters of men, and that these giants were instructed by their angel fathers in all that was supernatural and magical. This knowledge, says Zosimus, was written down in a wonderful book called "Chema." That nobdy has ever succeeded in locating a first edition of this book is extremely unfortunate.

Certain copper figures and cylinders are estimated to have been made in ancient Chaldea as far back as 4000 B.C. Alloys of bronze containing from 6 to 9 per cent tin have been dated as early as 2500 B.C. Articles of copper and bronze have been found in Egypt, Troy, Nimroud, and other centers of prehistoric and historic civili-

[7]Venable, F. P., "A Short History of Chemistry," pp. viii + 163 + 4, D. C. Heath & Co., Boston, 1894.

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zation. It is certain that tin bronzes were made as early as 3000 B.C. That the tin used in the fabrication of these bronzes originated in Britain is unlikely; it is more plausible to assume that it came from Persia or possibly from some as yet undiscovered source in southern Africa.

The Egyptians, Babylonians and Romans all used lead for a variety of purposes. The earliest known instance of ferrous metallurgy, according to Stillman[8], has been established at approximately 2500 B.C. and consisted of an article of iron found in the pyramid of Cheops. Steel was in common use in Egypt by 1300 B.C., a couple of centuries after its use by the Greeks. Other metals of early recognition and use include silver, zinc, mercury, antimony, and of course gold.

The independent preparation by Priestly and Scheele of oxygen in 1774 and the discovery by the latter in the same year of chlorine mark the transition from "magic" to chemistry as we know it today. The overthrow by Lavoisier of the phlogistic theory was regarded by the late Professor William H. Welch as the final deathblow of alchemy.

The first modern chemical laboratory was established in 1824 by Justus von Liebig, who became in that year professor extraordinary of chemistry at Giessen, at the age of twenty-one. Through Liebig's efforts and salesmanship with the Darmstadt government his laboratory became well equipped and well known. It was thrown open to all competent students and investigators, and marked the site of the birth of formal chemical instruction.

Electroplating was defined thirty years ago as the art of depositing metals by electric current. At that time it was doubtless more of an art than a science. Today it is still an art, but it is much more of a science than ever before.

In the year 1805, L. Brugnatelli discovered how to plate gold by using a solution of cyanide in much the same manner as in modern methods. Nickel plating was discovered by Boettger in 1840, in which year the electroplating industry is generally credited to have started in England, France and Germany.

[8]Stillman, John Maxson, "The Story of Early Chemistry," pp. xiii + 566, D. Appleton and Company, New York, 1924.

"Blueprint for Industry" is the title of an unusual 18-page booklet of engineering information on high-production convection heated ovens for batch and continuous heating processes used in armament production. The book is illustrated entirely by reproductions of blueprints showing typical installations of oven and materials handling equipment. It is Part II of a series.

Starting with a convection-heated box type or single compartment oven, the printed descriptions go on to cover multiple compartment ovens, continuous ovens and furnaces, multi-pass conveyor ovens for preheating, double-dipping, baking and cooling, and a number of complete oven-materials-handling systems.

Included is a continuous system for pickling, rinsing, scrubbing, drying, paint dipping and baking of steel sheets; a two-zone conveyor-type baking oven for welding rod and wire; a three-zone continuous double compartment core oven with preheating, baking and cooling zones; a continuous thermal shock testing machine for armor-piercing and semi-armor-piercing shot; and a festoon-type oven for processing continuous cloth.

On the last two pages of the book are printed engineering data, including the density, weight and volume of gases; the specific heat and density of various materials; volume and weight or air, and various fan law problems. A copy of the book may be obtained from the Industrial Oven Engineering Co., 11621 Detroit Ave., Cleveland, Ohio.

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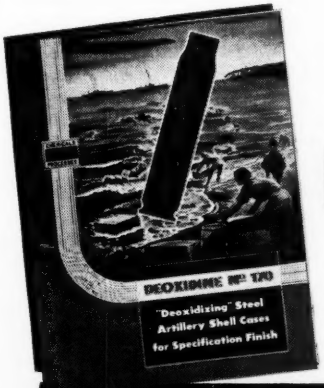
DEOXIDINE meets U.S. Ordnance Department requirements for its efficiency in removing rust and neutralizing rust producers before protective finishes are applied.



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A-7

Wrinkle Finishes - What You Should Know

By JEFFREY R. STEWART
Consulting and Analytical Chemist

PART 5

Answers to Technical Questions, with Special Reference to "Trouble-Shooting" Cases

IN this final section dealing with wrinkle finishes, an attempt will be made to list some of the popular questions that have been asked of the writer during various investigations.

What happens to metal products or parts which have been wrinkle finished, but which, due to lack of uniformity in surface texture or for other reasons, are rejected?

Either one of two things is usually done in such a case. The first is to remove the wrinkle finish with either a strong remover or by sand blasting, and then apply the wrinkle coating for a second try. The other method is to allow the articles to accumulate in a special bin or shelf for use by consumers who do not insist on very strict specifications. In the case of war materials, these rejected objects are frequently welcomed by the Allies, especially England, Russia and China. When a country is at war and in desperate need of munitions and parts, it is often willing to overlook any displeasing appearance of the finished protective coating. A radio transmitter, bomb sight or a range finder does not function any more efficiently when the wrinkle film is so applied as to give a beautiful film.

Some paint inspectors have been accused of holding up the war effort, although in a rather small way, merely by failing to permit certain instruments of war to pass the inspection line due to some minor and insignificant defect in the wrinkled film. The defect may be a flat spot, an irregular film texture, insufficient hardness of the baked film, failure to match the color of the established standard, or any of numerous other conditions.

What tests should be included in a specification dealing with wrinkle finishes?

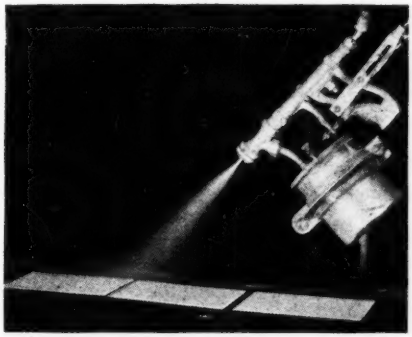
This total war we are waging would have a considerable effect on such a selection, because the more restrictive the specifications, the slower will be the speed of articles on the production line. In normal peace times, the following might be considered as the most important factors in a specification for wrinkle finishes:

1. Viscosity or mobility.
2. Settling.
3. Skinning.

4. Color.
5. Lifting.
6. Color composition.
7. Drying time.
8. Hardness or toughness.
9. Wrinkle texture.
10. Baking time.
11. Baking temperature.
12. Blackness of black finishes.
13. Odor.
14. Weight per gallon.
15. Flash point.
16. Resistance to various chemicals.

Note: It is not necessarily suggested that *all* of these sixteen conditions be specified. The list may be shortened or modified, depending largely on war production problems.

In the case of small consumers of wrinkle finishes, it is frequent practice to eliminate entirely mention of any specifications merely by purchasing a product of known satisfaction and standard. This, however, is somewhat undesirable and often leads to "trouble-shooting" cases.



The Bell Telephone Automatic Spray Gun is used to control the thickness of paint films.

How can a prospective user of wrinkle finishes obtain the names of manufacturers of wrinkle finishes?

On the outside back cover of a house organ known as "New Wrinkles in Finishing" can be found an extensive list of such manufacturers. This is the most complete one the author has seen. It includes many hundreds of manufacturers here in the United States, plus names of manufacturers in Canada, Honolulu, and other places. However, these names are confined to the licensees who are operating under the patents owned by New Wrinkle, Inc. Other lists may be found in industrial directories.

How can we obtain government specifications relating to wrinkle finishes?

It is assumed that you refer to government specifications issued by the Bureau of Standards and other governmental agencies in Washington, D. C. It is the general rule that federal specifications are not usually issued until two or more of the government agencies have already prepared their own, or have expressed a need for making them governmental rather than inter-department. At the present time, the government has not considered wrinkle finishes to be consumed in large enough quantities by the war agencies to warrant a special specification for their standardization.

However, in U. S. Army specifications, a new specification recognizes the fact that wrinkle finish is entitled to a separate classification. This is known as Class 500 Series HOMB ES-No. 680-a. The most popular Army specification relating to wrinkle finishes is Class 541, which is black in color. The requirements of this material are not very strict, the minimum total solids being 50 per cent, the pigment volume being 20 per cent maximum, and the vehicle solids being a minimum of 33 per cent. The pigmentation, according to this latest specification, requires that 5 per cent be carbon black pigment, with the balance of 95 per cent in the form of extenders. Those interested in the details can obtain copies of the complete specification by writing to the Office of Chief of Ordnance, U. S. Army, Pentagon Bldg., Washington, D. C.

It is interesting to note that the only other color specified in the U. S. Army for wrinkle finishes is olive drab. This is known as Class 542, and the pigment portion is composed of

Chrome yellow	28 per cent
Tinting pigments ..	10 per cent
Extenders	62 per cent
Total	100 per cent

What causes a wrinkle finish to wrinkle?

A brief explanation of this was given in the April, 1943, issue of PRODUCTS FINISHING. However, we assume that you are interested in a more detailed explanation, particularly as to the various ingredients in the enamel which cause the wrinkling condition. It is pretty well agreed that the most important ingredient in the wrinkling phenomenon is the oil present, such as tung oil, linseed oil or castor oil. However, there are other factors involved which, although of lesser importance, do account for the unusual phenomena.

The ratio of fast-evaporating to slow-evaporating solvents will have an effect on the wrinkle texture and, for this reason, the solvent formulation should not be varied without first consulting with the manufacturer of the wrinkle finish. It is difficult to correlate wrinkling behavior with the composition of various raw materials, because practically all of the raw materials used have a considerable effect on the finished film. This is one reason why emphasis has been placed on the fact that it is extremely important to follow the manufacturer's instructions with regard to application and use of wrinkle finishes. Hundreds and hundreds of batches of paint have been ruined merely because the spray mechanic had some personal preference or ideas regarding the addition of a special solvent or different drier which he wanted to add to the wrinkle finish before application. The old story about "Don't fool with something you know little or nothing about" can be very well applied to a new spray mechanic who wants to try some experiments of his own, only at the expense of the production schedule.

Are there any publications which contain detailed information on wrinkle finishes?

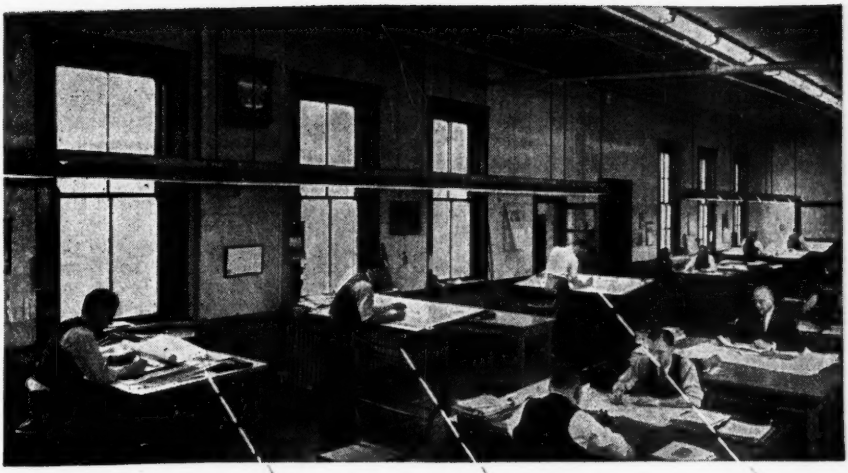
Publications on this subject are extremely scarce. Other than the series written by the author and published in recent issues of PRODUCTS FINISHING, little information on wrinkle finishes is available. You will find additional authentic material on wrinkle finishes in a publication written by Mr. G. G. Sward of the National Paint, Varnish & Lacquer Association, published under the title of S. S. Circular No. 518, "Wrinkle Finishes."

Is it always necessary to apply a primer before applying a wrinkle finish?

No. In fact, during speedy production such as is necessary in wartime, many testing engineers try to find a way to eliminate the primer or surfacer wherever possible. At the Tank and Motor Transport Center of Camp Holabird, Ordnance Depot of the U. S. Army, a recommendation has just been issued which states that all closed cab interiors need not be primed provided that a wrinkle finish is used. However, it is still necessary to clean the metal surfaces with a solvent followed by a metal conditioner.

What is the most desirable film thickness of the wet wrinkle finish in order to obtain the optimum characteristics?

This would vary for finishes made by different manufacturers. However, for the average product on the market today, a wet film thickness of 8 mils, plus or minus 1 mil, is suggested. A good spray mechanic should be able to control the thickness of the



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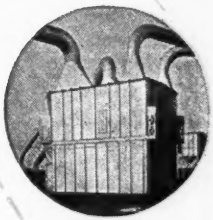
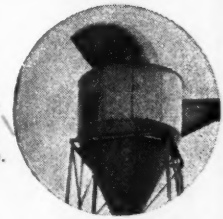


Dry products and clean air required; cloth filter selected.

Wet process air cleaning using ROTOCLONE.



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film within these limits if he is an experienced and careful spray gun operator.

Can we obtain a dependable instrument to predetermine the thickness of wrinkle finish films in order to eliminate the possibility of human error?

One such device for the control of film thickness is designated as the Bell Telephone Automatic Spray Gun. (It is our understanding that this gun is not marketed by Bell Telephone; however, they could undoubtedly supply the name of the manufacturer.) The spray gun is mounted on a suitable shuttle carriage, and the gun travels at a uniform rate over the metal to be coated. The thickness of the coating can be adjusted in two ways; first, by adjusting the speed of the moving spray gun and, second, by changing the viscosity and the volume of the material being sprayed. With this instrument, the film thickness can be controlled from 0.0001 to 0.0002 inches (2.5 to 5.0 microns). There are about seven or eight other devices on the market intended to accomplish the same purpose; they are listed in Gardner's Laboratory Handbook, with which you are probably familiar.

(The End)

Resilon Corrosion-Resistant Tank Linings are the subject of an eight-page bulletin, designated as Bulletin 1502, which has been prepared for distribution by The United States Stoneware Co., Akron, Ohio. Copy free upon request.

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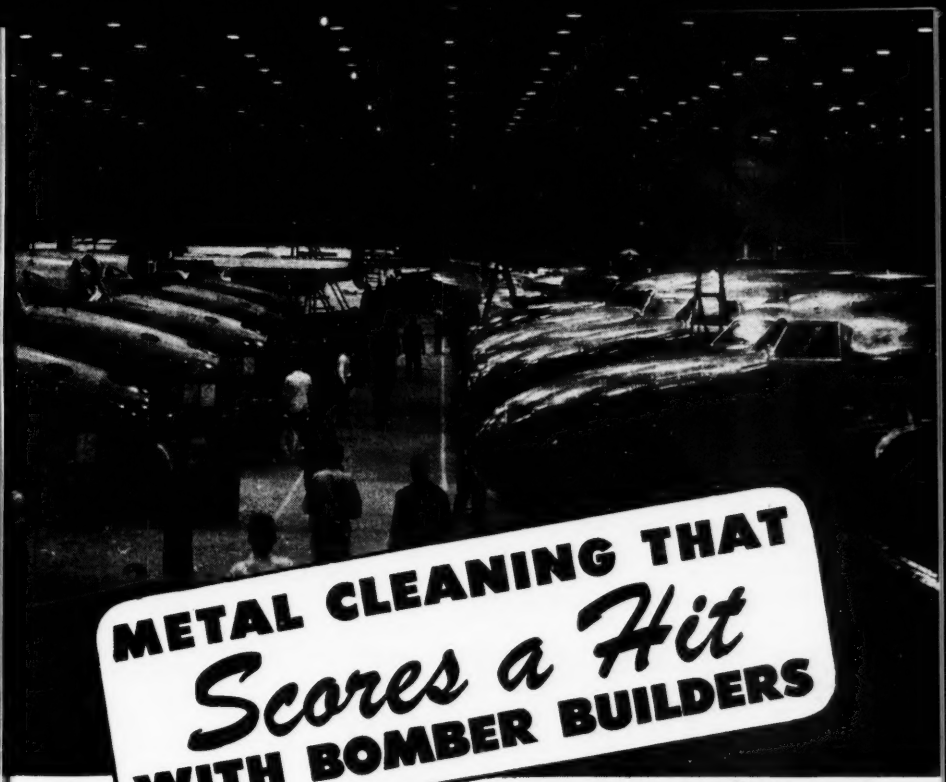

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Today they are doing a job of cleaning that has received the commendation of both government inspectors and the aircraft plants using their parts. More parts are cleaned better . . . faster . . . and at a lower cost than by their former method.

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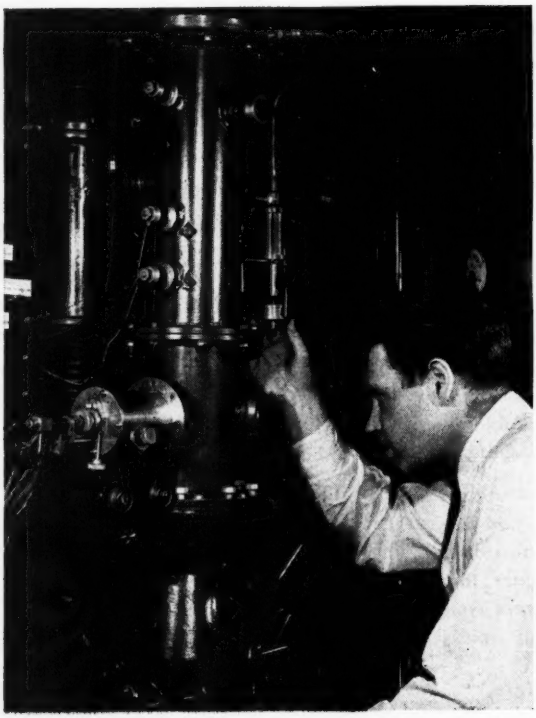
Dr. Gulbransen's work with an electronic diffraction camera is pointing the way toward longer-wearing bearings and cylinders for airplane and automobile engines, better tin plate in which the tin will cling more tightly to the steel underneath, and cheaper methods of making stainless steel.

Electrons are shot through the three-foot-long vacuum tube and bounced off a highly polished button of aluminum or steel on which an oxide coating is being built. The electrons ricochet off the faces of the block-like molecules that form the coating and continue downward at an angle to strike a strip of photographic film. The electrons trace a pattern of black and white semi-circles that



Dr. Gulbransen is shown here adjusting a valve that regulates the gas pressure in the tube where the electrons are being formed. Electrons ricoheting off the coating strike a photographic film and the resulting picture reveals the molecular structure of the coating.

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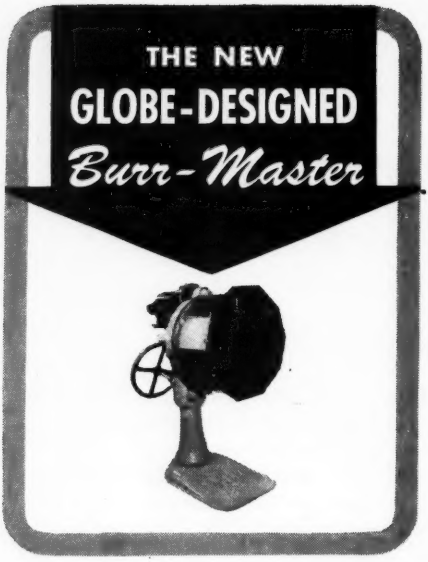


SPEEDS DIFFICULT DEBURRING OPERATIONS ON HARDENED PARTS

The new Burr-Master Tumbling Barrel was originated by Globe to provide a more rapid means of cleaning and deburring today's tougher metal parts The exclusive high, narrow construction of the barrel confines the work to a smaller area thereby achieving maximum pressure

The barrel itself is a two-piece, welded steel jacket lined with tough, seasoned maple that cushions the parts against nicking. The inner linings are easily and quickly replaced. The Burr-Master comes in two sizes. The Standard (illustrated) and the Senior. The Standard is equipped with a low-speed, gear-head motor and is the tilting type for easy loading and unloading. The Senior is a double compartment, horizontal type with water-tight shells. The Senior is recommended where large quantities of parts are to be deburred.

Write today for complete information about the savings you can effect with Globe Burr-Masters in your finishing department. No obligation.

THE GLOBE MACHINE AND STAMPING COMPANY
CLEVELAND 2, OHIO

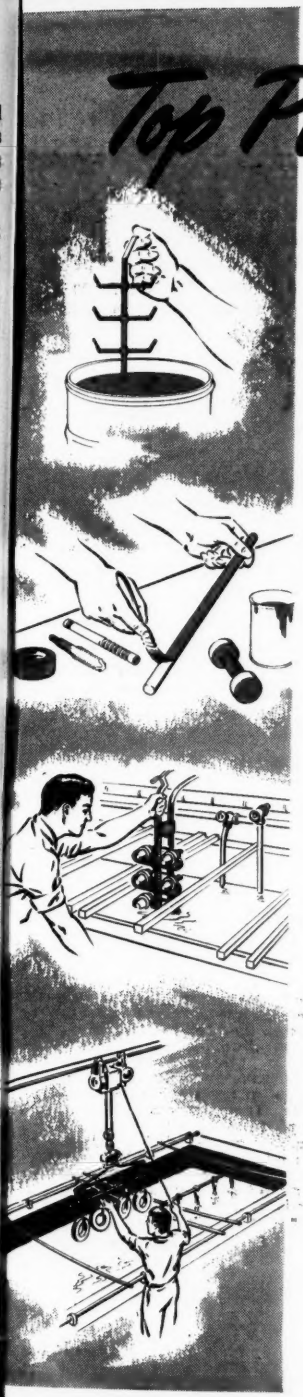
appear when the strip is removed from the camera and developed. This design is formed by the electrons bouncing off the different faces of the molecules in the coating.

The electronic bullets are forced out of a small aluminum rod at the top of the vacuum tube by 50,000 volts. When the voltage is applied to the rod, a pin-point area on the end of the rod gives off free electrons that speed through the tube at the rate of four and a half million miles an hour. The polished metal buttons that Dr. Gulbransen uses as targets are inserted six at a time in a magazine that fits into the side of the vacuum tube. By revolving the magazine he can bring any one of the buttons into the field of electronic fire. Electric resistance wires in the magazine heat the buttons to accelerate the formation of coatings. Growth of the oxide coating can also be speeded by admitting measured amounts of oxygen and hydrogen into the tube.

Small amounts of alloy metal can alter the nature of the coating formed on a piston ring, cylinder wall or motor bearing. Iron, for example, acquires a coating of rough iron oxide when exposed to air, but when one per cent of chrome is added to the iron the coating formed is chromium oxide—a thin, protective layer that hinders the oxidation of the metal.

Serviron. A permanently plastic material which is applied like paint to protect boiler drums, metal, wood or concrete storage tanks and water-submerged surfaces against corrosion and fungus growths is described in a bulletin published by Saverite Engineering Co., 1061 Clinton St., Hoboken, N. J.

Since it never dries hard, Serviron stretches and contracts with temperature changes, eliminating the danger of hairline cracks in the coating which would permit undetected corrosion under the protective surface. When applied to already pitted surfaces, Serviron is said to stop any further pitting. Copy of the bulletin free upon request.



Top Plating Production

. . . . when you get the *right* UNICHROME INSULATION for every stop-off and rack coating job!

RIGHT NOW, when you're driving equipment and platers to the limit, it's more important than ever to use insulating and stop-off materials that will safeguard every gallon of solution, every pound of metal, every priceless man-hour and finished part.

Here are six tried and proven materials, each offering an unequalled combination of properties, each formulated to meet specific problems.

☆**UNICHROME "AIR DRY" RACK COATING**
— a tough, easy-to-use rack insulation that saves frequent recoating — withstands hot alkaline cleaners, acid dips, hard chromium solutions and chromic or sulphuric anodizing baths.

☆**UNICHROME "QUICK DRY" STOP-OFF 322**
— a fast-drying, resistant lacquer that speeds preparation and handling — specially compounded for cyanide copper and other plating work requiring an extremely adherent stop-off.

☆**UNICHROME "QUICK DRY" STOP-OFF 323**
— a fast-drying, resistant lacquer that speeds preparation and handling — specially compounded for Parkerizing, chromium and other plating work requiring a stop-off that can be peeled off after use.

☆**UNICHROME RESIST SHEET AND ROD**
— a solid insulating material that is readily fabricated and extremely resistant to all plating room chemicals — specially suitable for constructing composite plating racks, stop-off shields, insulating gaskets and lattices for preventing short circuits in anodizing tanks.

☆**UNICHROME STOP-OFF COMPOUND 311**
— a solid, wax-like formulation that saves preparation time in stopping off complicated shapes — suitable for work requiring resistance to boiling hot cleaners, acid dips and high temperature plating solutions.

☆**UNICHROME RESIST LACQUER BG**
— a heavy-bodied, resilient insulating lacquer that has excellent all-round chemical resistance — for hard chromium and Parkerizing work requiring a stop-off that can be peeled off after use.

FOR FURTHER DETAILS—or an initial order, write briefly stating your problem and the work for which the stop-off or the insulation is intended.

☆*Trade-mark Reg. U. S. Pat. Off.*

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Waterbury, Conn. ☆ **Detroit, Mich.**

FBI Asks Workers' Help in Stopping Saboteurs

THIS year more than ever before, Americans in all walks of life and in every profession must consider themselves eyes and ears for the Federal Bureau of Investigation because a new class of Nazi saboteurs is soon to be "graduated" and loosed upon the world.

Unless Americans give this help, the Office of War Information warns in a roundup of citizens' cooperation, the FBI cannot guarantee to maintain its present remarkable record which—according to a recent report of the bureaus—has so far prevented any foreign-directed act of sabotage in this war.

This does not mean that the FBI wishes anything to be done which would embarrass or interfere with the millions of loyal Americans of foreign origin. As FBI officials have stressed many times, some of the most intensely patriotic Americans are those who obtained their citizenship papers after they were grown, for they, particularly, can appreciate the advantages of living in this country.

Many war industries depend to a considerable extent on the untiring efforts and the technical know-how of American citizens of foreign ancestry. For this reason especially, the Office of War Information urges industrial workers to make any reports of suspicious persons or actions to the FBI and not tell their neighbors, thus avoiding the dangers of unnecessary and often harmful rumor-spreading. The FBI is the expert agency, working significantly under the Department of Justice, which is best equipped to separate for investigation the true from the false.

Launching of Fighting Ship

Over 200 durable, quickly applied, Meyercord Decals were used for interior signs and markings on the first PCE (patrol craft escort) built on the production line in the Pullman Standard Car Manufacturing Company shops on the south side of Chicago. The ship was built piece-by-piece in a factory, then assembled and welded at the water's edge. The use of Meyercord Decals resulted in savings both in nameplate metals and in hundreds of man-hours of laborious stencilling work.

Acme Newspictures, Inc.

FRONT LINE ACTION *Begins* AT HOME ...METALS MUST BE CLEAN

USE THESE COMPOUNDS DEVELOPED FOR SPEEDED-UP WAR PRODUCTION

. . . Achieve metallurgically and chemically clean basis metals in less time—at lower operating costs . . . Special formulations for individual cleaning operations that have been laboratory tested and approved are now available, from Coast to Coast, for war material requirements.

ANODEX REVERSE CURRENT PROCESS AND HIGH CURRENT DENSITY COMPOUNDS
The original reverse current method developed by MacDermid for fast, positive, economical electro-cleaning of ferrous metals . . . Special compounds are now available for individual operations.

METEX NEW, IMPROVED HIGH SPEED COMPOUNDS
Available in various formulations developed for special cleaning procedures of aluminum, aluminum alloys, copper and brass materials of war.

METALEX ECONOMICAL, EASY-TO-USE, COMPOUNDS
Especially formulated by MacDermid chemists for faster, simpler cleaning of war materials in tumbling barrels and rotary washers.

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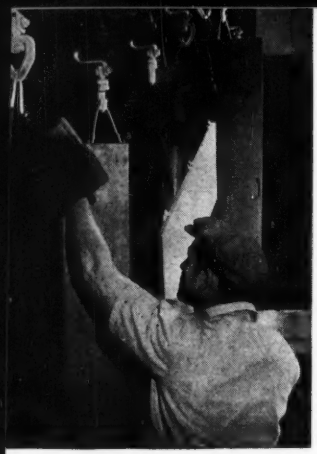

News OF THE INDUSTRY

Ruthruff New Sherwin-Williams Research Director

The Sherwin-Williams Company, Cleveland, Ohio, has announced the appointment of Dr. Robert F. Ruthruff as director of research for Sherwin-Williams and its allied companies.

Dr. Ruthruff, a graduate of the University of Michigan as well as a former member of the teaching staff of that institution, is widely known for his experimental and research work on various oils, gases, resins, and their by-products. Before joining the Sherwin-Williams organization in 1939, he was associated with E. I. du Pont de Nemours & Co., Standard Oil Company of Indiana, and the M. W. Kellogg Company.

Dr. Robert F. Ruthruff

Prior to his appointment as research director, Dr. Ruthruff had been in charge of oil research for The Sherwin-Williams Company. In this position he worked on both the development and production of raw materials from various petroleum fractions for the making of resins and synthetic drying oils. In naming Dr. Ruthruff, Sherwin-Williams maintains its policy of selecting young men for key positions. He is forty years of age, a native of Ohio, and was awarded a Ph.D. degree from the University of Michigan in 1927.

New Manager for Norton Distributor

George W. Person, formerly abrasive engineer in the St. Louis territory for Norton Company, Worcester, Mass., has taken a position in Chicago as manager of the Abrasive Division of Screw Machine Supply Company, one of Norton Company's Chicago distributors.

Changes in Pennsylvania Salt Staff

William P. Drake, recently appointed manager of sales of the Pennsylvania Salt Manufacturing Company, has been placed in charge of the company's sales of acid and alkali-resistant cements and chlorinated organic chemicals, in addition to his former duties as manager of

IT'S NO SECRET

— that more and more Planning and Production Engineers are finding that they can depend on our Cooperation and Experience.

We are devoted to bringing about the unconditional surrender of our country's foes as quickly and as completely as possible. We salute the tremendous effort in this direction, contributed also by our customers, our competitors and their clientele.

Munning Equipment in the following processes is helping to win the war:

- Anodizing
- Descaling
- Electro Plating
- Deburring
- Tumbling
- Mixing
- Buffing and Polishing
- Pickling
- Metal Cleaning
- Degreasing
- Salt Spray Testing
- Filtering
- Metal Coloring
- Other Specialized Operations

If you have a metal finishing problem, write us about it. We can doubtless help you and you will find our service of definite value. The "difficult" we do immediately, the "impossible" takes a little longer.

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A Complete Line of Requirements for the Metal Finishing Industry

the Pennsalt Cleaner Division. Mr. Drake started on April 7, 1934, at the Wyandotte Plant in the student training course. After spending several years in the various plants and in the executive offices, Mr. Drake took over the

William P. Drake

sale of Orthosil, a development of the company's research department. In May of 1939 he was appointed manager of the Pennsalt Cleaner Division, under which were combined Orthosil and other specialized industrial cleaners.

Albert H. Clem and Joseph J. Duffy, formerly in the Detroit and Rochester territories respectively, have been transferred to Philadelphia to assist Mr. Drake in the Pennsalt Cleaner Division. Both are chemical engineers, Mr. Clem being responsible for technical service to arms plants, while Mr. Duffy is responsible for technical service to the airplane industry. J. S. Dimon, formerly the company's local representative in Philadelphia area. has been given charge of sales and service in the transportation field, while W. J. Hennessy, with headquarters in Pittsburgh, is in charge of technical service to the steel industry.

Also assisting Mr. Drake in Philadelphia is Vincent A. Curll, a chemical engineer who has had considerable experience with acid and alkali-resistant cements. Mr. Curll is directly responsible for the service of these products which are used in construction work, particularly in the synthetic rubber and high octane gasoline programs.

Recent additions to Mr. Drake's department are Edward J. McDevitt, who is now located in St. Louis, and John C. Hampson, formerly in the General Laboratories Division, who has been transferred to the Pennsalt Cleaner Division with headquarters in Indianapolis. W. J. Stoddard, who formerly covered the Indianapolis territory, is now in the Detroit territory.

Philip Sievering Passes

Philip Sievering, founder and president of Philip Sievering, Inc., 199 Lafayette St., N. Y., and an outstanding leader in the electroplating industry, passed away on Tuesday, May 4, 1943, at the age of 79.

Philip Sievering was a Past Supreme President of the American Electroplaters' Society, a member of the Research Committee of that society, a member of Electrochemical Society, and was a charter member of the Masters' Electro-Plating Association.

Carmody Appointed by Aluminum Industries

Aluminum Industries, Inc., Cincinnati, Ohio, manufacturers of Permite Products, has recently announced the appointment of Michael Malachi Carmody as sales manager of the Paint Division. In this capacity, Mr. Carmody will have charge of the sales of Permite Ready-Mixed Aluminum Paints and Permite Industrial Finishes.

Since 1923 Mr. Carmody has been associated with the manufacturing and selling of industrial paints and varnishes, and during the past three years has specialized on servicing industries producing all types of equipment under the armament program.

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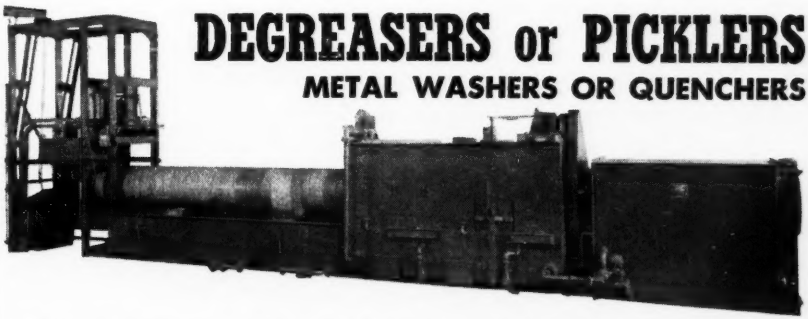


DEGREASERS or PICKLERS

METAL WASHERS OR QUENCHERS

Whether it's Degreasers or Picklers, Metal Washers or Quenchers which you require for your war work, Blakeslee has standard or ENGINEERED-FOR-YOU equipment for your problem. Regardless of the size of your production, we have the answer in the proper type of degreasing, washing, quenching or pickling equipment.

The above illustrated machine is a continuous pickle, rinse, neutralizer and soaper for 20 mm. cartridge cases, either steel or brass. This machine will take a 2000 pound batch at one load or a continuous supply of cases. We would appreciate the opportunity of working on any problems you have.

G. S. BLAKESLEE & CO.

NEW YORK — CICERO STATION CHICAGO — TORONTO

New PLANT EQUIPMENT AND Materials

Roto-Finish Deburring Equipment

Sturgis Products Company, Sturgis, Mich., has developed a unique mechanical method of deburring, buffing, honing, grinding and polishing parts made of steel, brass, aluminum, stainless or nickel steel, and so on. Articles handled include machine products, turret lathe products, milling machine products, stampings, castings, die castings, and drop forgings.

Dry Process Roto-Finish Machine

Roto-Finish is designed to handle much of the fine precision work produced in the manufacture of airplane parts, machine guns, and other war production parts. Thousands of small or medium parts can be deburred, buffed, polished or colored either before or after plating. Die and machining marks, rough edges, or corners are said to be quickly and effectively removed.

Roto-Finish is available either in the wet or dry process. The wet process is especially designed to handle heavy gauge stampings, large irregularly shaped parts, or to produce an especially smooth, bright finish.

The dry process machine is illustrated herewith. The dry process can be used advantageously for handling brass castings, light gauge steel and brass stampings, and die cast pieces before plating. It is said to effectively smooth the surface and edges through an abrasive action and, at the same time, impart a bright finish to the coloring properties of the dry finishing compound.

A unit designated as the "Roto Jr." is designed for use in plants where the size and quantity of the work is too small for the larger units.

M & W "Victory" Wrinkle Finishes

A line of wrinkle finishes containing no Chinawood oil has been developed by Maas and Waldstein Company, Newark, N. J. The "Victory" finishes closely resemble the standard wrinkle finishes, the manufacture of which is now restricted by government order for a few special applications because of the Chinawood oil shortage. According to the manufacturer, the finishes form hard, durable coatings, cover rough

metal surfaces effectively in a single coat, and are applied in regular wrinkle patterns by the same methods. They are obtainable in a full range of colors.

Binks Thor No. 17 Spray Gun

To overcome the difficulty experienced in obtaining aluminum and other wartime materials which have been holding

Binks Thor No. 17 Spray Gun

up the production of the Thor No. 7 and Thor No. 2 Spray Gun Models, the Binks Manufacturing Company, 3114 Carroll Ave., Chicago 12, Ill., is now producing the Thor No. 17 Gun. The Thor No. 17 Gun, while not possessing the elaborate finish of the Thor No. 7, is said to give equal performance and be a thoroughly dependable substitute for either the No. 7 or the No. 2.

The Thor No. 17 is recommended by the manufacturer as an ideal general purpose "wartime" gun. It does the work of its predecessors efficiently and can be used in all places and for all work heretofore performed by the Thor No. 7 and No. 2 Spray Guns.

Silco

A spray-on vitreous coating to be known as "Silco" has been developed by Mitchell-Bradford Chemical Company, 2446 Main St., Bridgeport, Conn. Inorganic in nature, Silco is said to resist acids, mild alkalies, rust, corrosion, heat, impact, abrasion, and so on. It is a dual finish which may be buffed to an egg shell gloss. Silco is sprayed, dried at 200 deg. F., and baked at 350 deg. F. in convection-type ovens or by infra-red lamps.

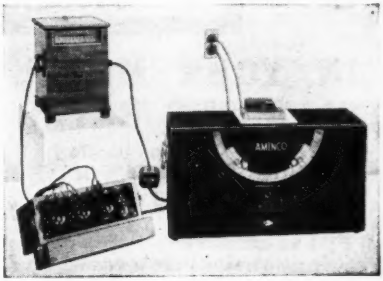
It is produced in black, Army drab and Navy gray. It is said to withstand heat up to 1,000 deg. F., is not affected by a 200-hour salt spray test, and provides an extremely hard finish for application to rigid surfaces. It is not flexible, although it will bend 30 deg. without breaking.

The customary thickness of coating is 1/1000 to 2/1000 of an inch. Surface preparation is either by sand blast or by alkali cleaning, acid pickling, washing and bonding. Products on which Silco is being used include gasoline engine exhaust manifolds, mufflers and pipes, steel parts boxes, and similar items. It is shipped in 55-gal. drums and 5-gal. containers.

Aminco-Scott Glossmeter

The Aminco-Scott Glossmeter (Goniophotometer), which has been placed on the market by American Instrument Company, Silver Spring, Md., measures high, medium and low gloss (from 0 to 100 per cent) of plane surfaces of materials over 2⅛ x 3 in. in size, such as paint finishes, enamels, lacquers, metals, wood, paper, plastics, glass and so on. Results are in terms of the I.C.I. Normal Observer and the I.C.I. Illuminant C.

The kinds of gloss (relative apparent



Aminco-Scott Glossmeter

reflectance) measured with this instrument are specular gloss, contrast gloss, distinctness-of-image gloss, absence-of-

bloom gloss, and many other optical properties of surfaces of all kinds. It is said to be especially useful for the A.S.T.M. method D523 for measuring specular gloss of paint finishes.

Some suggested supplementary uses are the measurement of the hiding power of deposited finishes, cleansing power of soaps and detergents, relative apparent reflectance of plane surfaces for obtaining Munsell value, index of refraction, resistance of surfaces to abrasion, weathering, wear, and so on, and for the measurement of glare.

Illumination is adjustable from minus 30 deg. to plus 70 deg. from the normal. The receptor is adjustable from plus 30 deg. to minus 70 deg. from the normal. Angles may be read to 1 minute of arc. Measurements of relative apparent reflectance from 0 to 100 per cent (in steps of 0.01 per cent) can be made.

The instrument operates on 110-120 volts, 60 cycles (controlled frequency) single-phase a.c., and is said to be unaffected by fluctuations in line voltage. It need not be operated in a darkened room. The Aminco-Scott Glossmeter consists essentially of four main components: (1) Goniophotometer; (2) reference plate and sample holder; (3) control and measuring unit, and (4) galvanometer. A standard glass reference plate is supplied. The entire outfit weighs approximately 55 pounds.

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ORVUS
IN YOUR METAL CLEANING BATHS

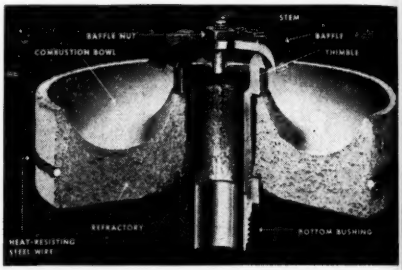
This sulfated fatty alcohol Cleansing Agent is EFFECTIVE
—as a surface tension lowering agent
—as an emulsifier
—in dispersing lime soaps which might cause poor plating results if permitted to deposit on the metal

Write for further information about Orvus to

PROCTER & GAMBLE, Cincinnati, Ohio

Burdett "Infra-Red Principle" Gas Burner

Burdett Manufacturing Company, 19 N. Loomis St., Chicago, Ill., is now marketing the Burdett "Infra-Red Principle" Gas Burner shown in the illustration. The burner is essentially a thermal radiator whose temperature is maintained by the combustion of an air-gas mixture on the radiating surface itself.



Burdett "Infra-Red Principle" Gas Burner

At its usual operating temperature of 2300 deg. F., the burner is said to act very nearly like an ideal black body radiator. It is claimed that approximately 99 per cent of its total radiation is in the form of efficient infra-red rays. It is largely this infra-red radiation which is so readily absorbed by the material to which the heat is applied, while at the same time virtually no energy is dissipated in traveling from the burner to the product. Heat rays are radiated at a 45-deg. angle from the burner with effective distribution—void of focal or hot spots—providing an even temperature across the entire expanse of radiation.

The Burdett Burner burns any commercially available gas from manufactured to hydrocarbon gas.

Farbertite Protective Coating

A coating for the protection and preservation of steel, tin, wood, concrete, and treated or untreated galvanized

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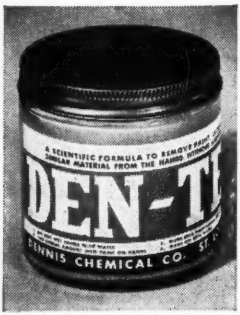

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Den-tex has been readily tested and accepted for use by some of America's largest manufacturers.

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1 lb. jar of Den-tex at the case price of 45¢ per lb. plus postage. Please order on company stationery.

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CHEMICAL COMPANY
2705 PAPIN ST. LOUIS, MO.

iron, to be known as "Farbertite," is now being marketed by F. J. Wilson Company, 1530 Chestnut St., Philadelphia, Pa. It has a coal tar base, and is soluble in water before applied, yet will adhere to such surfaces for which it is intended whether damp or dry. Farbertite can be used as furnished and can be applied with a brush, sprayed on, or spread with a trowel when mixed with silica sand. It is said to dry to the touch in four hours and set in 12; one gallon covers approximately 150 square feet.

It requires no priming coat, remains flexible, and is rust inhibitive. Farbertite is recommended by the manufacturer for a variety of general maintenance uses, in acid plants, power-utility plants, railroads, and similar locations.

Steel-Grip "Kick-Back" Safety Apron

Additional uses for the Steel-Grip "Kick-Back" Safety Apron, product of Industrial Gloves Company, 746 Garfield Blvd., Danville, Ill., are being found in

Steel-Grip "Kick-Back" Safety Apron

many industries. Originally designed for use in lumber mills, the apron is now successfully employed on grinding jobs and as protection when using automatic

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MASKING STICKERS

Come in the exact sizes and shapes you need. Simply press on—peel off. No moisture required. Sharp, non-curling edge.

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Write for name and address of your nearest Sparkler filtration engineer. Freely submit your plating solution clarification problems to us for analysis.

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hammers, drills and similar tools. The apron features the use of a bowed piece of fibre underneath a heavy canvas. The portion of the apron which is next to the operator's body is quilted for comfortable fit.

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Better Paint Adhesion
INDUSTRIAL CHEMICAL PRODUCTS CO.
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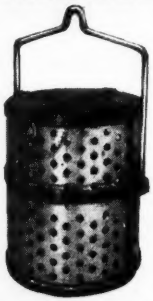
PROCESSING CARRIERS
LIKE THIS SPECIAL PICKLING BASKET, *Save* TIME...



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Write today.
ROLOCK, INC.
1400 Kings Highway East, Fairfield, Conn.

C-D/FOG Carbon Dioxide Fire Extinguisher

The General Detroit Corporation, 2200 E. Jefferson Ave., Detroit, Mich., has announced the development of a carbon dioxide fire extinguisher designated as the "C-D/FOG." The carbon dioxide discharge of the C-D/FOG is said to kill fire in a few seconds by penetrating to every corner where fire exists, excluding and replacing the oxygen necessary to combustion. Non-freeze and non-conductor, the C-D/FOG may be listed in the classification of "non-freeze" extinguishers; it may be discharged safely on live electrical equipment. It is claimed that fires in oils, greases and flammable liquids are quickly controlled by the C-D/FOG. The extinguisher discharge leaves no trace on the material on which it is used.

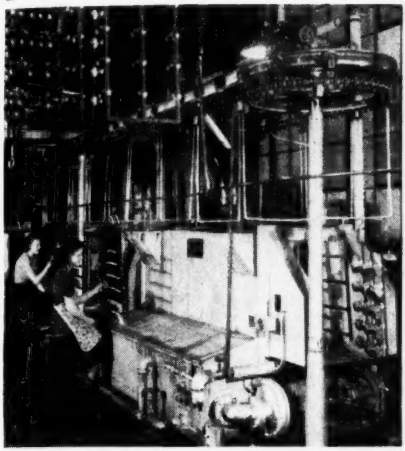
C-D/FOG
Carbon Dioxide
Fire Extinguisher

Magnus Metal Coating Compound

The Magnus Chemical Company, 208 South Ave., Garwood, N. J., has developed a metal coating compound for coating metal preparatory to drawing. The material is applied as a dip coating to high or low carbon steel wire, copper-coated wire and stainless steel wire after pickling. It was developed to replace the usual lime coat. Magnus Metal

For a real good polishing job use
KEYSTONE EMERY
TURKISH — NAXOS — AMERICAN
KEYSTONE EMERY MILLS *Write for Sample* **4316 Paul St., Phila., Pa.**

PROPER CLEANING CUTS DOWN REJECTED PARTS



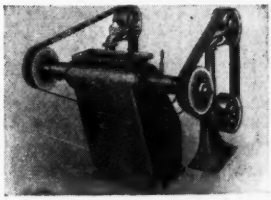
Racked parts are placed on overhead hangers. These carry parts through hot alkali wash. Pressure spray removes oil, grease and dirt, prior to cadmium plating. Plating rejections cut from 20% to less than 1% due to proper cleaning.

We can design and build a washing and drying system for your product. Write or wire for recommendations.

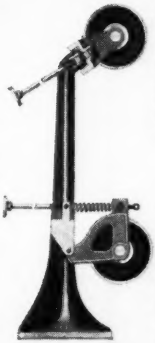
INDUSTRIAL WASHING MACHINE CORPORATION
291 BURNET ST.
NEW BRUNSWICK, N. J.

The New
JONES
BACKSTAND IDLER
NO. 120

For Faster Grinding and Polishing



Converts Your Lathe to Fast, Smooth, Even ABRASIVE BELT GRINDING



Ideal for crowded grinding and polishing departments, the Jones Abrasive Belt Backstand Idler No. 120 takes a minimum of floor space to convert your present lathe to fast, uniform, low-cost abrasive belt grinding.

- *Uses Minimum Floor Space*
- *Conveniently Located Controls*
- *High Speed—Fast Production*
- *Easy to set up*

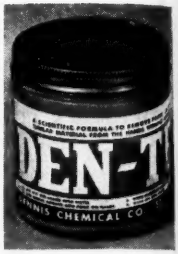
Note the simple arrangement above, using a regular lathe and two Jones Backstands. *Bulletin No. 120* gives complete details.

JONES ENGINEERING COMPANY
DEPT. B-2
ELLWOOD CITY, PENNSYLVANIA

Coating Compound is also used for coating steel cartridge cases or similar drawn shapes before drawing. This coating process is said to be cleaner and more economical than previous procedures.

Den-Tex

A compound for removing lacquer, dopes and paints from the hands without the use of explosive solvents is now being marketed by Dennis Chemical Co., 2701 Papin St., St. Louis, Mo., under the name of "Den-Tex." It is said that Den-Tex solves the problem of safe and thorough removal from the hands of the most tenacious and resistant materials such as lacquers, airplane dopes, enamels, varnish, resin solutions, synthetic adhesives, and so on. Den-Tex is merely worked into the paint or lacquer which is on the hands. The paint or lacquer then can be readily rinsed off with water, leaving the pores open and clean and the skin soft.

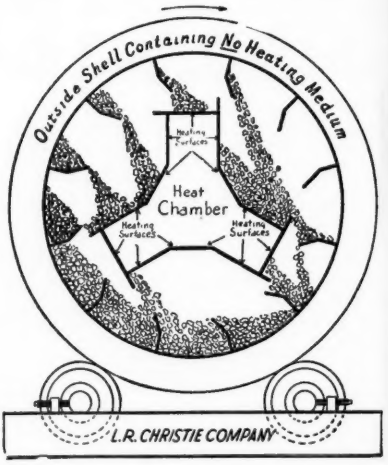


Den-Tex

WE RECOVER YOUR
SOLVENTS and THINNERS
from Sludge, Waste, Wash,
Spoiled Lacquers, etc.
AND SAVE YOU MONEY
Each shipment—one drum or a carload—receives
PROPER and SEPARATE TREATMENT.
Solvents recovered by the Lofgren Process.
Write to:
SOLVENTS RECOVERY SERVICE, Inc.
1019 Broad St. Newark, N. J.
or
HAMMOND CHEMICAL SERVICE, Inc.
241 Brunswick St. Hammond, Ind.

Christie Revolving Dryer

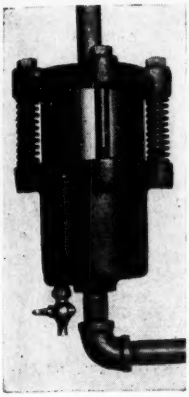
The L. R. Christie Company, 17 E. 42nd St., New York, N. Y., has placed on the market a revolving, semi-direct heat dryer which is said to provide a saving of heat and consequent fuel economy.



Christie Revolving Dryer

Instead of placing the material in a central drum or cylinder, with the application of the heat through chambers or flues on the outside of this cylinder, this

AVOID WASTE and SPEED UP PRODUCTION



UNIVERSAL AIR FILTERS—for compressed air lines—have proved their superiority over the years in the removal of condensed moisture, oil and other impurities. Using a synthetic porous stone as the filter medium (in addition to the well-known principle of centrifugal action), this filter delivers pure, dry air for process use by the leading Industrials of the U. S. A.

Maintenance is simple and easy. Two filter stones are furnished with each unit to assure continued operation during simple cleaning process.

Detailed information will be gladly supplied on request.

UNIVERSAL FILTER CO.

Manufacturers

7025 MANCHESTER AVE. **ST. LOUIS, MO.**

METAL CLEANING "KNOW-HOW"

"For cleaning zinc-base die cast materials before plating, we use Metso 66*. With previous compound, due to considerable etching of metal, we had to cut cleaning time to a point where grease removal was insufficient. Now with Metso, parts are chemically clean in 2-3 minutes, with no etching."

MID-WESTERN METAL PLANT

METSO CLEANERS
SODIUM METASILICATE
SODIUM SESQUISILICATE

*Sodium metasilicate cleaner for removing mineral oils and greases. Its special soluble silica ingredient restrains etching effect on sensitive metals. Ask for more facts. No obligation.

PHILADELPHIA QUARTZ COMPANY

GEN'L OFFICES: TENTH AND THIRD STS., PHILA., PA. • 9 PLANTS • DISTRIBUTORS IN 65 CITIES

principle has been reversed. The heat or gas is passed through a small drum or enclosed chamber which is rigidly suspended inside of and revolving with the large outer cylinder.

The material to be dried is placed between the outer shell of the dryer and the inner tube or chamber. In this way, no heat is allowed to contact the outer shell, except as dry gases for picking up exaporated moisture. In order to provide maximum heating surface area for the material to be dried, the surface of the inner casing or chamber is specially designed or shaped as shown in the accompanying illustration. This shape is said to allow the material to contact the heat for just the proper length of time.

Chemical Formulary. Volume VI. By H. Bennett, Editor-in-chief. 640 pages. Published by Chemical Publishing Co., Inc., 26 Court St., Brooklyn, N. Y. Price, $6.00.

The 1943 edition of the "Chemical Formulary" contains the latest formulas, processes and methods to use in the preparation of marketable products. Thousands of tested formulas from every important industry are given, including special elementary formulas of direct and indirect military interest. A chapter on substitutes for scarce materials is an innovation.

Chapters on the following subjects are included: Adhesives, Beverages, Cosmetics and Drugs, Emulsions, Farm and Garden Specialties, Food Products, Hides, Leather and Fur, Inks and Marking Materials, Lubricants and Oils, Materials of Construction, Metals, Alloys and Their Treatment, Paint, Varnish, Lacquer and Other Coatings, Paper, Photography, Polishes and Abrasives, Pyrotechnics and Explosives, Rubber, Resins, Plastics and Waxes, Soaps and Cleaners, Textiles and Fibers.

Lanly Ovens for Industry are described and illustrated in a 16-page bulletin prepared by The Lanly Company, 750 Prospect Ave., Cleveland, Ohio. Features of control, construction and operation are discussed in relation to the various Lanly products — heat treating and conditioning equipment, paint drying and baking ovens, core and mold ovens, and cabinet type ovens. Copy free upon request.

Lead Plating is the subject of an eight-page folder has been written for platers and which is designed to answer their questions about lead plating with Harshaw fluoborate lead concentrate. In addition, it covers such subjects as the kind of tank to be used, thickness of deposits, voltages, current densities, temperatures, and solution control—factual data that will help any electroplater who is planning to do lead plating. A copy of this informative booklet may be obtained from The Harshaw Chemical Company, 1945 E. 97th St., Cleveland, Ohio.

Correction

Use of the term Trichlorethylene in the advertisement of Phillips Manufacturing Co., on page 8 of the May, 1943, issue of this publication, was in error. The term Tetrachlorethylene was intended and should have been used instead.

"STEP UP PRODUCTION"
with
McKeon's
"Liquid Sulphur"
FOR STRIPPING COPPER
Five simple steps to efficiency.
Sample FREE
SULPHUR PRODUCTS CO.
GREENSBURG • PA.

WANTED
SALES ENGINEER

Sales Engineer wanted by old established manufacturer of complete line industrial synthetic enamels, lacquers, etc. Territory Eastern Pennsylvania. Salary and bonus. Write stating qualifications, age, etc. Our men know of this ad. Address: Box No. 74, PRODUCTS FINISHING, 431 Main St., Cincinnati 2, Ohio.